

Message

From: Beller, Harry [Beller.Harry@epa.gov]
Sent: 5/1/2020 8:36:56 PM
To: Stralka, Daniel [Stralka.Daniel@epa.gov]
Subject: RE: Question on PFAS HHRA

No, I often refer to Table ES-1 in the EFH and tables in the EFH updates, but I haven't yet dealt with these specific ones.

Harry

Harry Beller, Ph.D.
U.S. EPA Region 9
75 Hawthorne St., Mail Stop SFD-6-1
San Francisco, CA 94105

Office: (415) 972-3112
beller.harry@epa.gov

From: Stralka, Daniel <Stralka.Daniel@epa.gov>
Sent: Friday, May 1, 2020 1:32 PM
To: Beller, Harry <Beller.Harry@epa.gov>
Subject: RE: Question on PFAS HHRA

That was what they were asking about. I thought you might have been familiar with the default exposure assumptions. I'll follow up with them.

From: Beller, Harry <Beller.Harry@epa.gov>
Sent: Friday, May 1, 2020 1:09 PM
To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: RE: Question on PFAS HHRA

Hi Dan,

I haven't come across any RAD HHA before, so I'm not familiar with the Hunter's Point issues.

I wasn't clear if you were asking me "Can you evaluate and let me know if you think there is a valid basis for the Navy's proposed changes (or other changes from the default values)?" or if you were quoting an e-mail to you. Let me know if you want me to help with this.

Harry

Harry Beller, Ph.D.
U.S. EPA Region 9
75 Hawthorne St., Mail Stop SFD-6-1
San Francisco, CA 94105

Office: (415) 972-3112
beller.harry@epa.gov

From: Stralka, Daniel <Stralka.Daniel@epa.gov>
Sent: Friday, May 1, 2020 12:40 PM

To: Beller, Harry <Beller.Harry@epa.gov>

Subject: RE: Question on PFAS HHRA

Thanks, I was not aware of the response levels, but that is more or a risk management application. I think you should be comparing to the notification levels but to include the response levels would not be unwarranted. It doesn't look as if the Water Board is using the combined total, however, Federal HA does and you would need to include that.

On another note, I wonder if you know of this off hand. This is a question for Hunter's Point RAD modeling. I plan to work on this this afternoon.

As we discussed, we have been working with the Stuart and the Army Corps to evaluate the Hunters Point remediation goals (RGs) for radiological contaminants in buildings. The RGs were adopted back in 2006 and have been incorporated into multiple RODs at the site.

The Navy evaluated the RGs by running the numbers through EPA's Building PRG calculator (BPRG) and DOE's RESRAD BUILD calculator. The risks associated with the RGs are much higher using BPRG compared to RESRAD. As an example, for radium-226, the RG is 100 dpm/100cm². The estimated risk is two orders of magnitude higher using BPRG compared to RESRAD BUILD (2.9×10^{-4} vs. 3×10^{-6}).

The BPRG calculates ingestion dose as the product of four factors: (surface concentration) x (hand-to-mouth frequency) x (fingertip surface area) x (saliva extraction factor)

The Navy has proposed changing some of the default inputs into the BPRG, including the following:

BPRG Input	BPRG default	Navy proposed change	Navy rationale for proposed change
Hand to mouth frequency	3 hr ⁻¹ (adult)	1.64 hr ⁻¹ (adult) (No change proposed for child.)	<i>"Average for Age 7-26 from EPA 2000 page D-4). The BPRG default values for FQ (17 events/hr child and 3 events/hr adult) are based on the 2011 Exposure Factors Handbook Table 4-1. However, there is no data for adults older than 11 years and the BPRG default values are based on those for 6-11 years. The 2017 update to Chapter 5 of the EFH uses 1 event/hr for adults (Pages 5-37, 5-65). From the 2003 World Trade Center report page D-5, the time-weighted average for adults age 7-26 is a minimum of 1.35/hr, maximum of 1.92/hr and an average of 1.64/hr."</i>
Fingertip surface area	49 cm ² (adult) 16 cm ² (child)	11.5 cm ² (adult) 3.7 cm ² (child)	<i>"Area of three fingertips from Sahmel et al.,2014 rather than full area of three fingers). The EPA default for saliva extraction factor is 50% based on pesticide studies in 1994. A 2014 study (Sahmel et al.) of transfer of lead to three fingers found the factor is 24% and is more applicable to the Navy contaminants. The authors note similar in 3rd para of their introduction. See https://academic.oup.com/annweh/article/59/2/210/2740608. In the same paper, they measure the area of three fingertips. The BPRG assumes that dust is transferred from an area equivalent to three fingers, not just the tips. The paper is more accurate and their value of 11.5 cm² for the area of three adult fingertips is used. The EPA hand areas for adults (980 cm²) and children (317 cm²) are used to get the area of three child fingertips, or $11.5 \times 317 / 980 = 3.7 \text{ cm}^2$."</i> (Although they comment on the saliva extraction factor, the Navy is not, as far as I can tell, proposing to reduce the default value of 50%)

The BPRG Users Guide says the following about the sources of the default values:

- Frequency of Hand to Mouth (FQ)

The exposure factors handbook (EPA 2011, Table 4-1) and the World Trade Center report (EPA 2003) provide hand to mouth contact rates for many age groups. For the child FQ, all age groups for mean indoor contact from birth to 6 years old were time-weight averaged from the exposure factor handbook. Missing data points were substituted with data from the nearest age group. The FQ for children was determined to be 17 times/hr. For the adult FQ, all age groups for mean indoor contact from 6 to 26 years old were time-weight averaged from the exposure factor handbook and World Trade Center report. The FQ for adults was determined to be 3 times/hr.

- Surface Area (SA)

In general, this is the skin area contacted during the mouthing event. The OPP recommended default was based on the surface area of the 3 fingers that a child will most likely use for hand to mouth transfer. It was assumed that 3 fingers of one hand represents about 5% of the total area of both hands (EPA 2003). The exposure factor handbook (EPA 2011, Table 7.2) presents hand surface areas for adults and children. For children, the surface areas were time-weight averaged across all age groups from birth to 6 years (317 cm²), and the 5% assumption was applied to derive the child hand surface area of 16 cm².

The hand surface area for the adult was also derived from data presented in the exposure factor handbook (EPA 2011, Table 7.2). The exposure factor handbook presents hand surface areas for adult males and females of 1070 and 890 cm², respectively. These numbers were averaged to 980 cm², and the 5% assumption was applied to derive the adult hand surface area of 49 cm².

Can you evaluate and let me know if you think there is a valid basis for the Navy's proposed changes (or other changes from the default values)?

From: Beller, Harry <Beller.Harry@epa.gov>
Sent: Friday, May 1, 2020 12:09 PM
To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: RE: Question on PFAS HHRA

Hi Dan,

Here's a fact sheet (Feb. 2020) from the Water Board that cites the RLs for PFOS and PFOA.

Hope you're doing well and keeping busy.

Thanks again,
Harry

Harry Beller, Ph.D.
U.S. EPA Region 9
75 Hawthorne St., Mail Stop SFD-6-1
San Francisco, CA 94105

Office: (415) 972-3112
beller.harry@epa.gov

From: Stralka, Daniel <Stralka.Daniel@epa.gov>
Sent: Friday, May 1, 2020 11:55 AM
To: Beller, Harry <Beller.Harry@epa.gov>
Subject: RE: Question on PFAS HHRA

Good you are busy. Yes I would include an evaluation of the additive 70 ppt as well. Where are the response levels? I thought they only had notification levels out that were lower? That should be presented as well. This is all clear as mud!

From: Beller, Harry <Beller.Harry@epa.gov>
Sent: Friday, May 1, 2020 11:26 AM
To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: RE: Question on PFAS HHRA

Thanks, Dan!

They did compare directly to the Notification Levels. They should also have compared to the recent Response Levels (10 ng/L for PFOA and 40 ng/L for PFOS), which I noted in our comments (FYI, individual PFOA exceeded RLs and PFOS was up to 45 ng/L, exceeding its RL). The 70 ng/L EPA lifetime drinking water Health Advisory was not mentioned.

For a HHRA, do you think it's sufficient to compare to NL and RLs, or should the 70 ng/L standard also be mentioned?

I'm staying pretty busy, as Sophia is giving me additional projects as I finish comments on the previous ones. I've worked on about 7 projects so far.

Thanks again,
Harry

Harry Beller, Ph.D.
U.S. EPA Region 9
75 Hawthorne St., Mail Stop SFD-6-1
San Francisco, CA 94105

Office: (415) 972-3112
beller.harry@epa.gov

From: Stralka, Daniel <Stralka.Daniel@epa.gov>
Sent: Friday, May 1, 2020 10:56 AM
To: Beller, Harry <Beller.Harry@epa.gov>
Subject: RE: Question on PFAS HHRA

Hi Harry, I don't know of any other values for CA.

I have PFOA 5.1 ppt
PFOS 6.5 ppt

If you use the 2016 RfD, the RSL calculator results in a 400 ppt. The drinking water program has 70 ppt, combined, based on the lactating mother/infant exposure. Did they compare to the DW notification level directly? How does it compare to the 70 ppt drinking water level of concern? I would not use the calculator but compare to the notification levels directly.

How are you doing? Keeping busy?

From: Beller, Harry <Beller.Harry@epa.gov>
Sent: Friday, May 1, 2020 10:18 AM
To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: Question on PFAS HHRA

Hi Dan,

Hope you're doing well.

Kathleen Aisling (RPM for OCWD North Basin) had a question for me about PFAS on the just-completed draft OCWD RI (and HHRA, which came out in March). You probably know that Sophia will be away for a couple of weeks, starting today. In their HHRA, OCWD dealt with PFAS (PFOS and PFOA) by noting how their concentrations compared to the Water Board's Notification Levels and Response Levels, and by calculating noncancer risk from ingestion by using an RfD of 20 ng/kg-day (I think this is from EPA 2016).

Is this as much as anyone can do on HHRA for PFAS right now? Since this is for California, do you know if there is an updated RfD for PFOA and PFOS? Also, I've seen mention of a 0.07 (mg/kg-day)⁻¹ oral slope factor for PFOA (EPA 2016), but OCWD didn't use this, and I didn't confirm its existence.

Basically, my question is whether you know of better toxicity values for PFOS and PFOA and if they've been updated in CA, or are the NLs and RLs the best we can do right now for HHRA?

Thanks for your help,
Harry

Harry Beller, Ph.D.
U.S. EPA Region 9
75 Hawthorne St., Mail Stop SFD-6-1
San Francisco, CA 94105

Office: (415) 972-3112
beller.harry@epa.gov